Helena National Forest
Riparian Inventory and Monitoring Strategy

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Background

The Helena Forest began a Forest-wide riparian inventory in 2008, the purpose of which was to address five primary issues:

- Forest Plan monitoring element C12 (riparian resource element) needs to be more fully addressed. The intent of this element is to assure management activities do not degrade the habitat of riparian-dependent species. Five specific habitat types and components are listed: shading for streams; fish habitat; song bird habitat; forage and browse; and diversity (Forest Plan, pg IV/9).
- Forest Plan monitoring element D4 (condition and trend of range and forage availability) needs to be more fully addressed. The intent of the element is to "identify long term changes in range conditions and trend, recommend change in management strategies and/or stocking levels" (Forest Plan, pg IV/11).
- There is a need to ensure that the riparian guidelines in the Helena Forest Supplement No. 2209.21-98-1 (effective July 29, 1998) are met.
- There is a need to more accurately and precisely monitor the effects of livestock grazing Forest-wide, both short and long-term, to meet the intent of NEPA and NFMA. There is little quantitative information on the current status of riparian areas with the exception of specific reaches in critical bull trout habitats.
- Pursuant to Executive Order 13186 66 Fed. Reg 3853 (2001) Responsibilities of Federal Agencies to Protect Migratory Birds and MOU has been developed between the Forest service and U.S. Fish and Wildlife Service (FS Agreement # 08-MU-1113-2400-264 signed 12/8/08 by Abigail Kimbell) to strengthen migratory bird conservation. This includes but is not limited to: monitoring, habitat restoration, and evaluation of the effects of agency actions on migratory birds

There is a need to know the extent and distribution of various types of riparian habitat and associated wildlife species (with an emphasis on birds), and to establish a baseline for those habitats so that the above issues can be addressed. In order to understand the effects of management activities benchmarks of unmanaged riparian habitats are needed, as well as managed habitats.

This paper outlines two monitoring strategies. The first is a Forest wide approach for long-term, quantitative, replicable monitoring in grazed riparian areas to respond to Forest Plan monitoring requirements. The second provides a strategy for inventory related to allotment management plan updates, and short- and long-term monitoring in livestock grazing range allotments associated with those plans. The long-term Forest-wide monitoring can be funded using NFIM, NFWF, NFRG and NFVW funds. The short-term monitoring can be funded with the same funds, as long as it is used to address the Forest Plan monitoring elements identified above.

The monitoring should be institutionalized into the overall Forest program of work to ensure the monitoring element is adequately addressed over time. Forest Plan and long-term monitoring funding will be primarily NFIM, with supplemental funding from other areas. Annual monitoring reports are part of the Forest Plan Monitoring Report project file.

Long-term Forest-wide Monitoring

The Forest hydrologist, fish biologist, wildlife biologist, range program leader and ecologist do not believe the *Proper Functioning Condition* (PFC) methodology by itself is adequate to respond to the above issues. The PFC methodology is useful when used in conjunction with more quantitative methods to address the issues outlined above. The Cowfish model was identified in the Forest Plan as a preferred methodology. This method is no longer in use, and this paper recommends updating to current methodology.

PIBO Effectiveness Monitoring Method

The PIBO (Pacfish-Infish Biological Opinion) effectiveness monitoring protocol will be used for the Forest-wide inventory and long-term monitoring methodology, using a stratified random sample. The recommended stratification of sites includes streams within livestock grazing allotments, 6th-HUC watersheds, stream gradient classes and geology. The gradient classes to be sampled are 0-2.9% and 3-4.9% classes. The minimum reach length was set at 200 meters. Appendix A documents the GIS protocol used to create the stratified layer, and shows the strata.

The National PIBO sampling will provide a non-grazed baseline, so the Forest will focus on grazed areas. We selected 6th-HUC drainages to ensure good sample distribution across the Forest. We assume that we will see different responses due to both gradient and geology.

The full PIBO effectiveness protocol is used with a few slight variations. All of the plots will be permanently monumented using the R1 grid intensification procedures. The vegetation plot cover calls use the canopy cover methodology described in the R1 grid intensification documentation. Measured water quality parameters also differed somewhat from PIBO protocols in 2008, but those parameters will be the same as the protocol after 2008. Invertebrates will not be sampled due to the cost of analysis. Results from the National PIBO sampling will be used to respond to Forest Plan monitoring needs for invertebrates. No other substantive modifications were made to the protocol.

A minimum of a 10% random sample within each strata described above will be monitored on a ten-year return interval to respond to the Forest Plan monitoring questions. The proposed sampling is shown in Appendix A.

The responsibility for establishing and re-reading the PIBO plots resides with the Forest hydrologist and ecologist with input from other resource areas.

Wildlife Monitoring
Bird point counts will be established at each PIBO reach, and conducted according to the *NORTHERN REGION LANDBIRD MONITORING PROGRAM FIELD METHODS*. The return sampling interval for these counts will be five to ten years.

Data will be analyzed according to methodologies developed for the Northern Region Landbird Program and synthesized with riparian vegetation data to determine species abundance, diversity, and distribution by habitat conditions.

The responsibility for establishing and re-reading the plots resides with the Forest wildlife biologist.

Livestock Grazing Allotment Riparian Inventory and Monitoring

Allotment Management Plan Updates
When beginning the data collection process for allotment management plan updates, the full length of all flowing streams that provide livestock forage within an allotment should be assessed using PFC (Proper Functioning Condition) methodology. The PFC methodology provides a standard, qualitative assessment of riparian conditions within a grazing allotment, and also provides some useful information for Forest Plan monitoring. The extent of all reaches will be mapped using accurate GPS waypoints, with photographs taken as proscribed in the Helena Forest PFC supplement. The results of the PFC assessment will help guide the placement of key areas. The responsibility for this mapping resides with the Forest hydrologist, fisheries biologist, and ecologist.

Long-term Monitoring
When allotment management plans are updated, at least one PIBO effectiveness monitoring reach will be established on an allotment. This plot will be placed at a key area using standard PIBO protocols with the differences described on page 2, and will be re-read every five years. A key area is defined as the most susceptible area to effects from livestock grazing within a pasture. More than one key area may be necessary on large pastures or on allotments where pastures are not defined. The number and placement of plots will be a consensus between the range specialist and the Forest hydrologist or fisheries biologist, at a minimum. If one plot is established, it will be the same location as the PIBO effectiveness monitoring plot. The key area location will be agreed to by the administering range specialist and the hydrologist or fisheries biologist, at a minimum. The responsibility for establishing and re-reading the PIBO plots resides with the Forest hydrologist and ecologist.

Short-term Monitoring
A Forest-wide approach is needed for annual monitoring that will support Forest Plan monitoring requirements, meet the intent of the Forest riparian guidelines and provide managers as well as permittees valuable information with which to guide annual livestock grazing practices. It is important that the monitoring is achievable.

A minimum of one key area per pasture will be designated where the PIBO (Pacfish Infish Biological Opinion) implementation monitoring protocol will be used to determine whether the intent of the Helena

supplement FSH 2200.21-98-1 is being met. This protocol consists of bank alteration and stubble height monitoring. Where woody vegetation dominates the monitoring site with little or no herbaceous vegetation along the greenline, woody use (browse) will be measured in lieu of stubble height. The R1 bank alternation protocol will be used, and stubble height methodology will follow the PIBO implementation guidelines. The preferred browse measurement protocol is Keigley and Frisina, Browse Evaluation by Analysis of Growth Form. The number and placement of plots will be a consensus between the range specialist and the Forest hydrologist or fisheries biologist, at a minimum. If one plot is established, it will be the same location as the PIBO effectiveness monitoring plot. The responsibility for this monitoring will be the range specialist responsible for administration of that allotment and the permittees.

Permittees are encouraged under current AMPs to complete stubble height and utilization monitoring under utilization standards and guidelines within the AMPs. Based on proposed management schedule, a prepared key area monitoring list with defined parameters for the season of use is developed annually. Permittees are encouraged to complete the monitoring often enough to predict movement dates and planned moves can be accommodated with minimal resource impact. Range specialists will begin to train permittees when new decisions are implemented with the new R1 bank alternation protocol and stubble height methodology from the PIBO implementation guidelines.

These plots will be evaluated annually for high priority allotments, every three years for mid-priority allotments and every five years for low priority allotments. Each allotment administered on the Forest is given a label of priority A,B or C. This rank is based on the need to address a permit compliance issue, and/or to implement all or parts of a livestock grazing decision and other factors such as unauthorized use. This prioritization is used as a way to allocate limited staff and budget resources to allotment administration. The priority an allotment receives is evaluated and chosen each year by the administering range specialist and line officer.

Adaptive Management
Recognizing that knowledge about natural resource systems is sometimes uncertain, ***Adaptive Management*** is a system of management practices based on clearly identified intended outcomes and monitoring to determine if management actions are meeting those outcomes; and, if not, to facilitate management changes that will best ensure that those outcomes are met or re-evaluated.

Results from the short-term monitoring of riparian guidelines (e.g., bank alteration & stubble height) will determine the need for adjustments in livestock management, on an annual basis, to meet the guidelines. Long-term monitoring (e.g., PIBO) determines riparian condition at points in time and the trend in condition between those points. It will be used to adjust livestock management, permitted use (numbers or time) and, possibly, short-term guidelines or desired conditions at appropriate intervals (five to 10 years), to reach appropriate desired conditions.

Annual Reporting and Data Storage
All data collected will be stored in the appropriate National database. Resource specialists responsible for collecting the data will send data to the Forest Inventory and Monitoring program leader for coordination with the Forest data group. The Forest data group will be responsible for data entry. Individual range specialists will also keep records with the associated allotment record.

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List of Preparers

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APPENDIX A

A GIS exercise was undertaken in 2007 by a contractor to identify riparian areas that met the criteria identified by the Forest hydrologist, fisheries biologist, wildlife biologist, soil scientist, range program leader and ecologist. A grouping that included streams, livestock grazing allotments, within a 6th code HUC with geology and gradient breaks was used to identify suitable reaches.

The following table shows each layer and where it is found.

Layer	Source name	Remarks
Grazing allotment boundaries	FSSDE.Allotment_Pat	
Digital elevation model	J:/fsfiles/ref/library/rs/dems/dem10	
Streams	J:/fsfiles/ref/library/rs/dems/dem10	Streams were created using the model
6th code HUCs	FSSDE.NRCSHuc12	
Geology	FSSDE.GeologyNRIS500	

The following table shows the number of reaches within livestock grazing allotments, within a 6th code HUC with geology and gradient breaks. Each reach is a minimum of 200 meters long. The shaded gradients show the 0-5% gradients that are included in the sample for the Forestwide grazed reaches. Gradients beyond 5% slope were broken into classes as well, both for information and with the idea that steeper gradient streams may be sampled over time.

Geology group	Gradient	10% Sample	Completed	Total
Extrusive Volcanic Rock	0-3%	1		8
	3-5%	2	3	15
	5-8%			42
	8-12%			60
Hard Sedimentary Rock	0-3%	1		1
	3-5%	1	1	10
	5-8%			49
	8-12%			62
Intrusive Volcanic Rock	0-3%	1		8
	5-8%	1		2
	8-12%			5
Moderate Sedimentary Rock	0-3%	3	3	25
	3-5%	8	10	77
	5-8%			190
	8-12%			254
Plutonic Rock (Granitic)	0-3%	2	3	24
	3-5%	2	1	23
	5-8%			103
	8-12%			104
Soft Sedimentary Rock	0-3%	5	5	45
	3-5%	7	2	66
	5-8%			98
	8-12%			147
Unconsolidated Deposits	0-3%	8	4	82
	3-5%	10	9	97
	5-8%			145
	8-12%			152
Total number of reaches				1894